

Water Issues in Berkeley County West Virginia

*Growth
Availability
Drought
Contamination*

GROWTH

- Berkeley County is the fastest growing county in the state. Located just over an hour from Baltimore, MD and Washington D.C.
 - 28 % growth in last decade
- Positioned for continued economic growth, its transportation corridors include Interstate 70, Interstate 81 and the MARC train system.
 - Expect to double in population in next 20 years

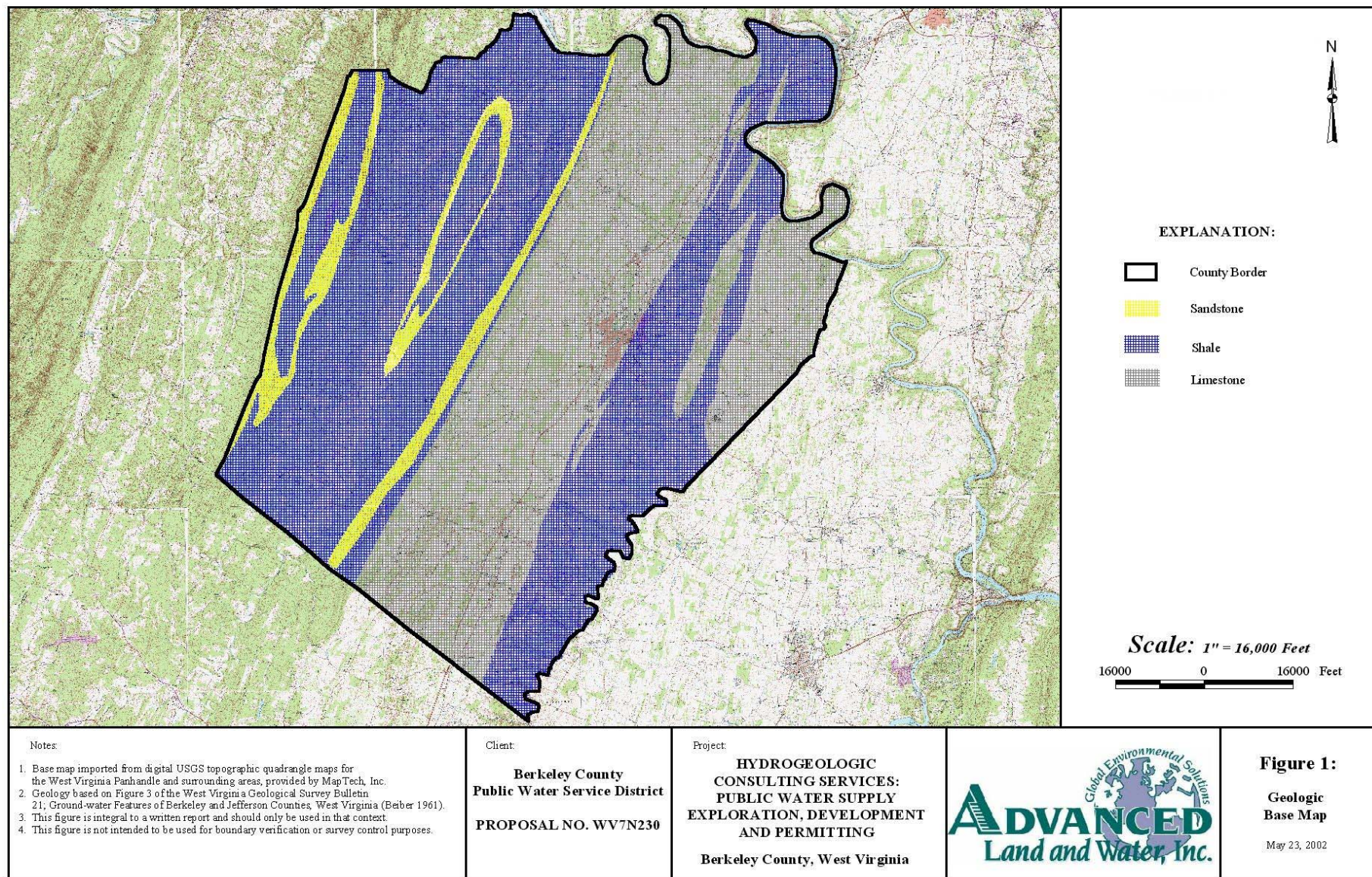
GROWTH

- As the largest water district in the state, Berkeley County Public Service Water District currently maintains three water treatment plants. Water is provided to:
 - 13,000 Households
 - Adding 100 new customers per month
 - 756 Commercial Establishments
 - 24 Industrial Facilities
 - 40 Public Authority and Bulk Water Customers

AVAILABILITY

- Ground-Water in Berkeley County
 - Shale aquifers can yield as much as 100,000 gals/day of water per square mile.
 - Limestone aquifers can yield as much as 600,000 gals/day of water per square mile.
 - Optimal well depths in limestone appear to average between 150 and 200 feet.
 - Well depths greater than 500 feet in limestone are not economically practical.

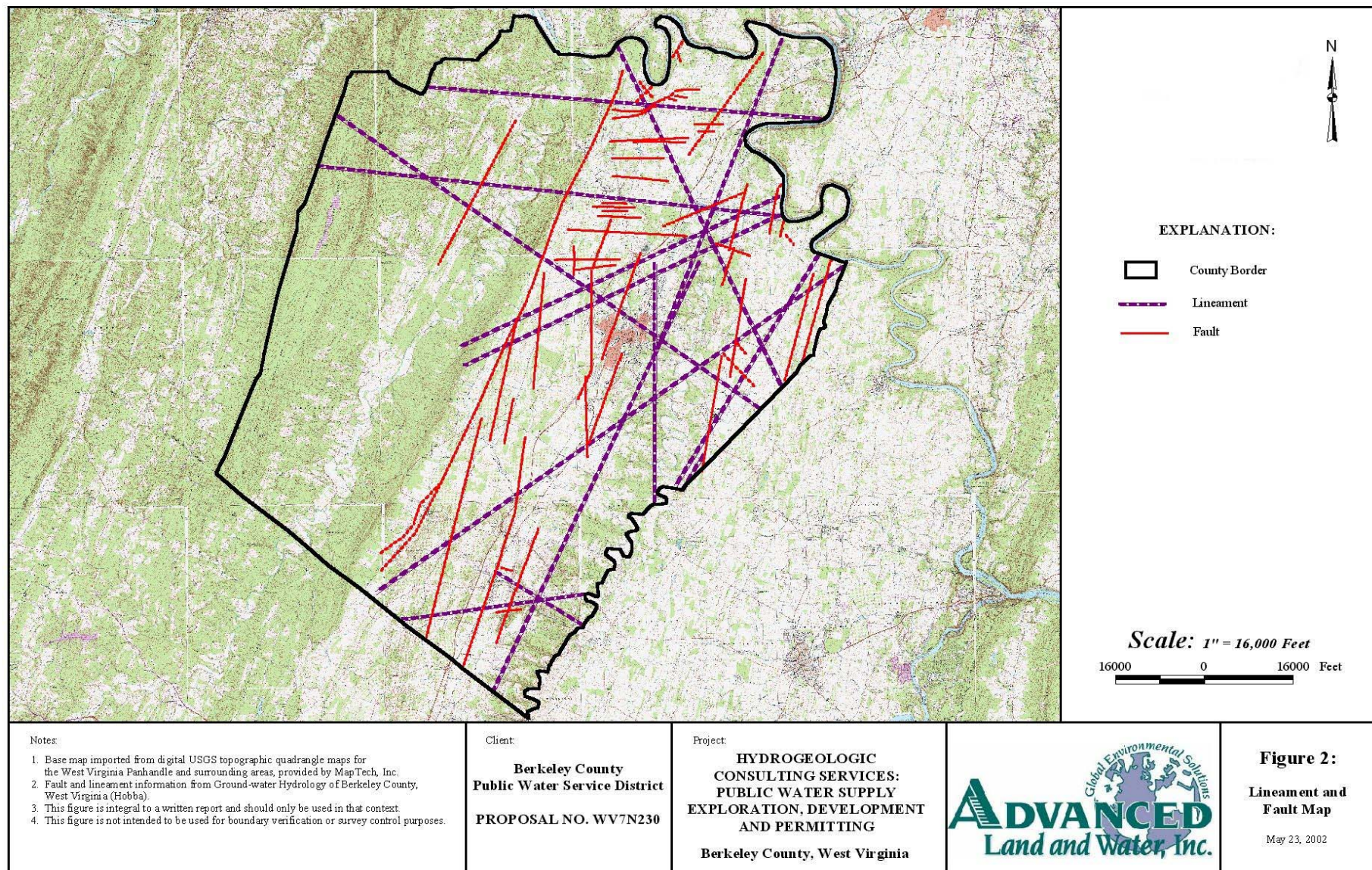
AVAILABILITY



AVAILABILITY

- Water Yield Relative to Fault
 - Wells within .25 mi of a fault have higher yields than wells greater than .25 mi of the fault.
 - Median capacity was 3.6 gal/min/ft in wells < 700 ft from a fault and only .26 gal/min/ft > 700 ft of a fault.
 - Wells near fault lineaments typically have higher yields than more distant wells.

AVAILABILITY

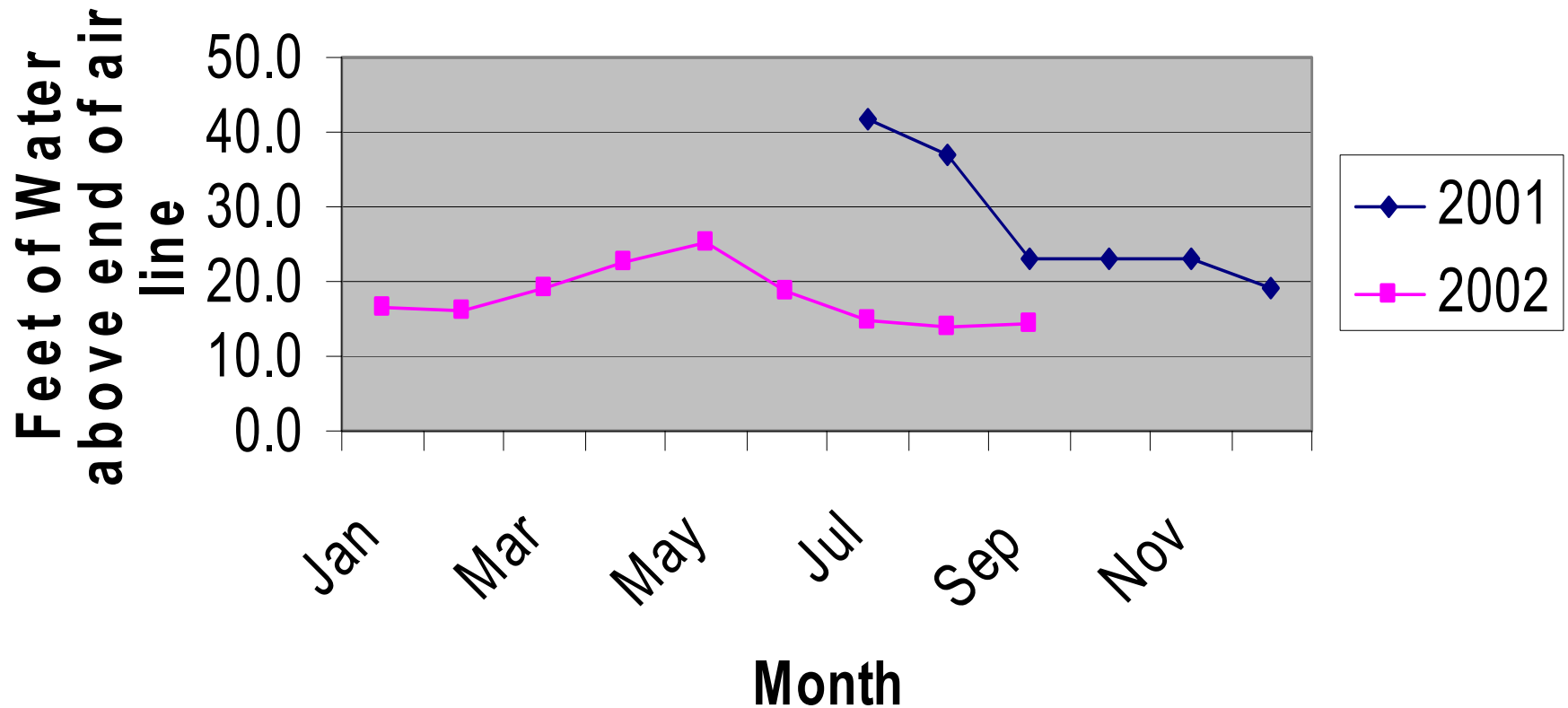


DROUGHT

- During the winter and early spring of 2002, Berkeley County experienced the most severe drought in history.
- Rainfall was 12 to 13 inches below normal.
- According to NOAA long range forecasts, rainfall is predicted to be below average for 9 out of the next 18 months.

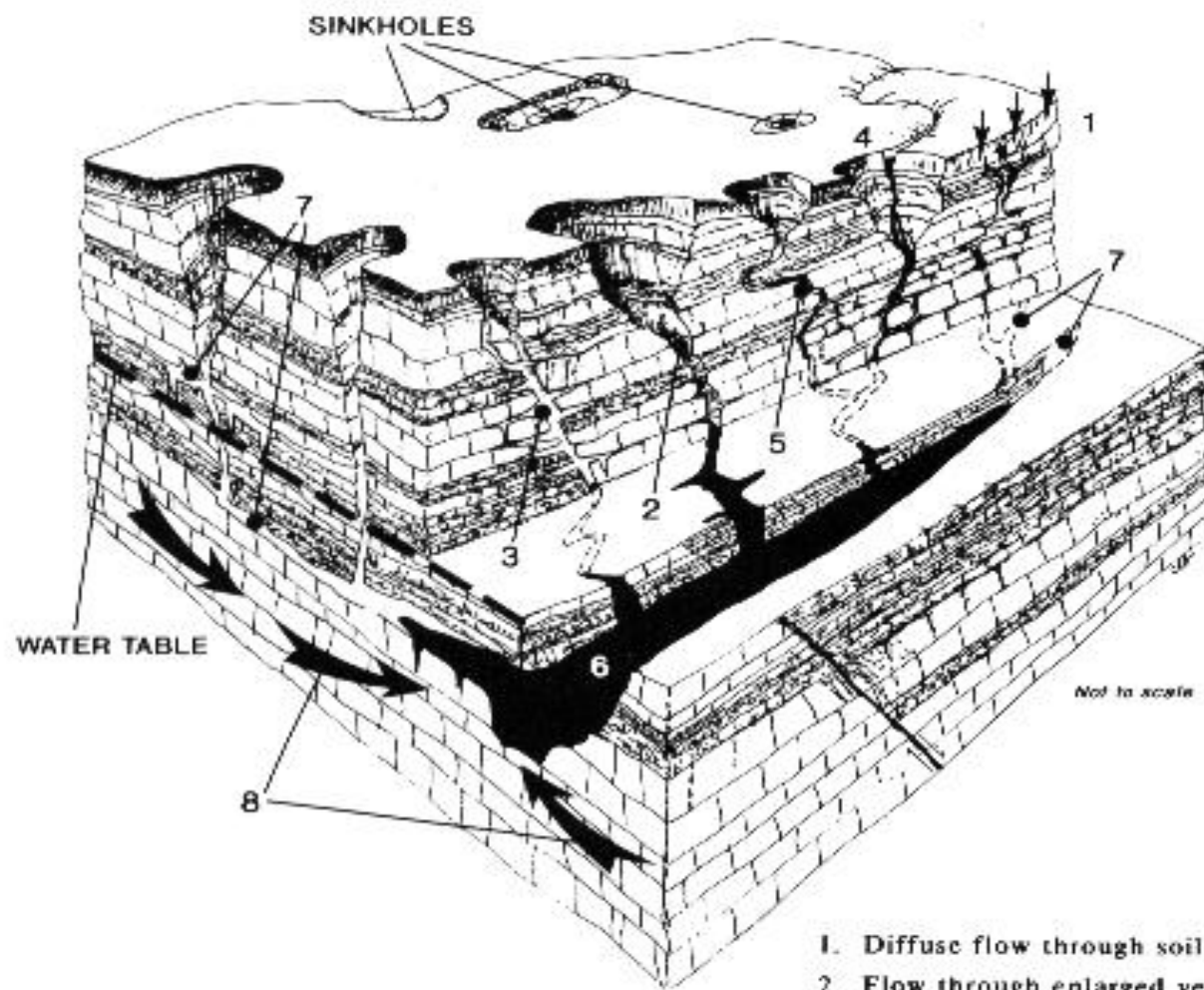
DROUGHT

Glenwood Forest Well No. 6



CONTAMINATION

- Limestone aquifers easily contaminated by surface land-use and point-source activities.
- Same geologic features which makes karst a good aquifer, allow it to be easily contaminated.
- Extensive systems of fractures, faults, solution conduits, and sinkholes allow contaminants to easily enter and rapidly move through aquifer.



EXPLANATION

1. Diffuse flow through soil, residuum, or unconsolidated surficial material
2. Flow through enlarged vertical conduits
3. Diffuse flow through joints, fractures, faults, and bedding planes
4. Surface streams draining into sinkholes
5. Horizontal and vertical flow to master conduit
6. Water-filled master conduit
7. Air-filled conduit
8. Flow lines of diffuse ground-water flow

Modified by D.S.Mull and others, 1988

Figure 3. The components of ground-water flow in a cavernous carbonate aquifer.

Bacteria in Aquifers

- ✧ In 2000, USGS sampled 50 wells primarily in Karst topography.
- ✧ Found significant percentage of wells contaminated with coliform bacteria –*e.coli* & *fecal coliform*.
- ✧ Source of contamination unknown
 - No correlation between contaminated wells and density of septic systems

Bacteria Contamination

- ✧ USGS, WVDEP, WV Public Health, and Berkeley County Commission contributed funds to evaluate source typing methodology.
- ✧ Uncertain at this time if any of the procedures by used can appropriately identify contamination.
- ✧ If proven satisfactory, wide application

Source Water Protection (SWAP)

- ✦ EPA encourages local community ownership for protecting source water.
- ✦ Many Berkeley County residents concerned that water sources are at risk due to growth and contamination. Therefore strong local support

SWAP Phase 1

- ✧ Resources: USGS, EPA Region III, USDA, WV DEP, WV Department of Health, Canaan Valley Institute, Berkeley County Water District and Planning Commission
- ✧ Identified the problem and developed a protocol for addressing problem
- ✧ Tutored in Hydrogeology, Karst terrain, vulnerabilities, recharging aquifers, storm water management, etc.

SWAP Phase II

- ✧ Over 60 local stakeholders responded to County Commission request for participation
- ✧ Mission: Identify issues and achievable solutions. Submit to County Commission by Sept. 2003
- ✧ Five subcommittees: Resources; Sewer & Septic; Transportation & HAZMAT; Growth & Stormwater Mgmt.; Agriculture & Wildlife

Research Needs for Eastern Panhandle

- Hydrogeologic Model for Area
 - Identify new sources
 - Impact of Drilling Multiple Wells in close proximity
 - Impact of additional residential wells
- Inventory of Existing Wells & Septic Systems
- Extensive dye tracing to delineate local water sources
- Inventory of Sink Holes
- Determine source of bacteria contamination found in some wells

Additional Research Needs

- ✧ Map of pre-1972 septic systems
- ✧ Local Storm Water Management
- ✧ Development of a Master Water Resource Plan